

FAUNISTIC NOTE

New records of the freshwater jellyfish *Craspedacusta sowerbii* in Romania

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Abstract

We present new records of *Craspedacusta sowerbii* (freshwater jellyfish) in anthropogenic freshwater habitats south of Bucharest in Romania; these are the first records of this alien species in free waters of the Argeș basin.

Keywords

Craspedacusta sowerbii, new records, Romania.

Craspedacusta sowerbii Lankester, 1880 (Hydrozoa: Limnomedusae: Olindiidae) is a widespread freshwater jellyfish, the life cycle of which includes both a polyp stage and a medusa stage. It lives in stagnant or slow-moving fresh water and feeds upon small invertebrates and rarely fish larvae (DeVries 1992). It is often thought to be indigenous to the Yangzi river area in China (DeVries 1992; Dumont 1994) and to have been introduced throughout the world by human agency, though it may (also) have been passively spread by migrating waterbirds as adherent dessication-resistant polyps/buds (podocysts, frustules) (Dumont 1994; Marchessaux et al. 2021a). *C. sowerbii* is quite thermophilic and projected to potentially gain suitable habitat as a consequence of global warming (Marchessaux et al. 2021a). This species is remarkable for its erratical "blooming" pattern, with short-time proliferation events followed by (pseudo)absence (Gagiu 2020; Marchessaux et al. 2021a). It is nowadays found on

all continents except Antarctica, and is known from most European countries (see a synthesis of its gradual spread, or at least discovery, per country and year in Europe: Gagiū 2020). In Romania, its first published observation dates from 1945, from a basin in the greenhouse of the Botanical Garden – presumably the one in Bucharest, since the authors worked here (Dobreanu and Șerbănescu 1946)¹. The species is, however, little known, with significant temporal gaps between records; later findings pertain to the Danube Delta and the Dobroudja, the Danubian plain (including Oltenia), the Banat area and near Oradea (Dumont 1994; Gagiū 2020; Marchessaux et al. 2021b; Popa et al. 2022). We attempt to extend the knowledge of the distribution of this adventive/opportunistic species by presenting new observations in free waters of Romania, in an area where it was not known previously.

Here we report two new records of *C. sowerbii* in Romania, both in free waters of the Argeș watershed, where the species was previously unknown. The casual observations of *C. sowerbii* were made as a result of photographic and sportive scuba dives performed by the first author. Both observation sites are in artificial freshwater habitats, immediately adjacent to the Argeș river flow, 50 m upstream; these were lock systems intended for a never-completed Danube-to-Bucharest navigable canal, planned by the communist authorities in the 1980s. Situated at Falaștoaca (44°11'49.50"N 26°11'38.75"E) and at Budești (44°13'39.5"N 26°27'52.4"E) (Fig. 1), they now cover a surface area of about 5 ha (lake in Budești) and about 4.5 ha (lake in Falaștoaca) with a maximum depth of 10 m (lake in Budești) and 12.5 m (lake in Falaștoaca) including various submerged concrete structures, with macrophyte growth as well as decomposing organic sediment (Fig. 2).

Both water bodies are part of a complex wetland mosaic (Fig. 3), which provide numerous terrestrial and aquatic animals, as well as breeding and stopover habitats to important number of birds. The shores of the two freshwater lakes are covered by reeds in association with a variety of species associated with wetland and riparian plant communities, while the underwater facies is dominated by algal and *Myriophyllum* communities. The lakes are inhabited by a number of fish species (e.g. *Cyprinus carpio*, *Scardinius erythrophthalmus*, *Esox lucius*, *Silurus glanis*, *Babka gymnotrachelus*, *Proterorhinus semilunaris*, *Perca fluviatilis*, *Sander lucioperca*, *Lepomis gibbosus*) and various freshwater invertebrates – e.g. *Hydra oligactis*, *Cordylophora caspia* (Hydrozoa), *Dreissena polymorpha*, *Ampullaceana balthica* (Mollusca), *Plumatella repens* (Bryozoa), *Limnomysis benedeni*, *Pontastacus leptodactylus*, *Ischnura elegans*, *Cloeon inscriptum*, *Chironomus* sp. (Arthropoda), as well as undetermined freshwater sponges and Hydracarina. *C. sowerbii* was observed during daylight dives (between

¹ Gagiū (2020) gives 1936 as the year of the first Romanian record, and quote a supposed paper by Șerbănescu and Panțu (1936) (Despre *Craspedacusta sowerbii* în România. Notationes Biologicae, Bucarest, 1:1), which we were unable to find; however, nr. 1 of Notationes Biologicae would correspond to the 1933 issue, not to an 1936 one, and Dobreanu and Șerbănescu (1946) clearly state that their record is the first Romanian finding of *C. sowerbii*, which would not have been the case had Șerbănescu (=Șerbănescu) found and published it ten years earlier.



Figure 1. Waterlock lake – Budești. The red rectangle marks the location of *Craspedacusta* sighting dives – drone photo by Alex Damian.



Figure 2. Macrophytes and decomposing substrates – photo by Cristian Mitrofan.



Figure 3. Wetland mosaics – drone photo by Alex Damian.

10.00–16.00) in both lakes as the medusa stage (Fig. 4); at Budești, it was firstly recorded in September 2018, then in August–September 2019 (e.g. on 5 Sept. 2019), in reduced densities ($0,1 \text{ ex/m}^3$ or lower), but was absent in 2021 and subsequently; at



Figure 4. *Craspedacusta sowerbii*, medusa, close-up image, photo by Cristian Mitrofan.

Falaştoaca it was observed in August–September 2022, in great numbers (an explosive development, typical for this species; densities reached 3–4 ex//m³) when the water temperature was recorded to be in the range of 20–24°C; however, *Craspedacusta* was only observed within the superficial water layers, at a depth from 0 to 3 or 4 m (Fig. 5), where the temperature was 24°C. The boom-and-bust dynamic, with sudden appearance of the medusa form and subsequent disappearance after a few years, followed by just as sudden appearance in a nearby similar habitat, is typical for this species and shows its cryptic occurrence/spread in the larger Argeş river ecosystem.

These observations are important in extending the range of this species in Romania and adding to the knowledge of its life cycle dynamic under local conditions. As for its introduction, it may result from transport by either birds or human agency (fishermen which may have introduced it along with instruments or with fish release). The species should be further monitored, in order to evaluate its spread and ecological importance/impact in Romanian waters, but its sporadic, ephemeral occurrence as the easier-observed medusa stage makes this difficult; citizen science input could be more than useful in this instance.



Figure 5. *Craspedacusta sowerbii*, medusa, shown in shallow water habitat, photo by Cristian Mitrofan.

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